

CLAIMS:

1. A synthetic peptide selected from the group consisting of:

- (i) a peptide of at least 12 and at most 30 amino acid residues based on a
 5 complementarity-determining region (CDR) of the heavy or light chain of a pathogenic anti-
 DNA monoclonal antibody that induces a systemic lupus erythematosus (SLE)-like disease
 in mice (hereinafter CDR-based peptide), a salt or a chemical derivative thereof;
- (ii) an analog of a CDR-based peptide defined in (i), a salt or a chemical derivative
 thereof;
- 10 (iii) a dual synthetic peptide comprising two such peptides of (i) or analogs of (ii)
 covalently linked to one another either directly or through a short linking chain;
- (iv) a peptide polymer comprising a plurality of sequences of said peptide (i) or
 analog thereof (ii); and
- (v) a peptide polymer (iv) attached to a macromolecular carrier.

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2. A synthetic peptide according to claim 1, capable of:

- (i) inhibiting specifically the proliferative response and cytokine secretion of T
 lymphocytes of mice that are high responders to SLE-inducing autoantibodies; or
- (ii) inhibiting development of SLE in mice that are susceptible to SLE-induction by
 20 pathogenic autoantibodies.

3. A synthetic peptide according to claim 1 or 2, being selected from the
 group consisting of peptides having the sequences I to V herein, wherein:

(i) the peptide of sequence I has the formula:

T G Y Y X₁ X₂ X₃ X₄ X₅ Q S P E K S L E W I G [I]

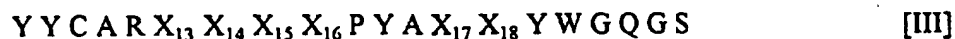
25 wherein X₁ is Met, Ala or Val; X₂ is Gln, Asp, Glu or Arg; X₃ is Trp or Ala; X₄ is
 Val or Ser; and X₅ is Lys, Glu or Ala;

(ii) the peptide of sequence II has the formula:

E I N P S T G G X₆ X₇ X₈ X₉ X₁₀ X₁₁ X₁₂ K A K A T [II]

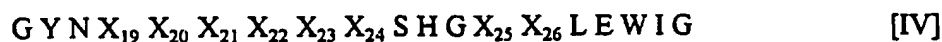
wherein X_6 and X_7 are each Thr, Val or Ala; X_8 is Tyr or Phe; X_9 is Asn or Asp; X_{10} is Gln or Glu; and X_{11} is Lys or Glu, and X_{12} is Phe or Tyr;

(iii) the peptide of sequence III has the formula:



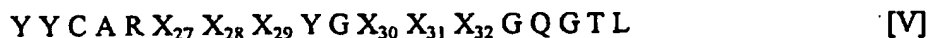
5 wherein X_{13} is Phe, Thr or Gly; X_{14} is Leu, Ala or Ser; X_{15} is Trp or Ala; X_{16} is Glu or Lys; X_{17} is Met or Ala, and X_{18} is Asp, Lys or Ser;

(iv) the peptide of sequence IV has the formula:



10 wherein X_{19} is Met or Ala; X_{20} is Asn, Asp or Arg; X_{21} is Trp or Ala; X_{22} is Val or Ser; X_{23} is Lys or Glu; X_{24} is Gln or Ala; X_{25} is Lys or Glu, and X_{26} is Ser or Ala; and

(v) the peptide of sequence V has the formula:



wherein X_{27} is Ser or Phe; X_{28} is Gly or Ala; X_{29} is Arg, Ala or Glu; X_{30} is Asn or Asp; X_{31} is Tyr or Phe, and X_{32} is Trp, His or Ala.

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4. A peptide according to claim 3, having a sequence Ia of the formula:



5. A peptide according to claim 3, having a sequence IIa of the formula:



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6. A peptide according to claim 3, having a sequence IIIa of the formula:



7. A peptide according to claim 3, having a sequence IVa of the formula:



8. A peptide according to claim 3, having a sequence Va of the formula:

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9. A dual synthetic peptide according to claim 1 or 2, in which two different sequences I to V in claim 3 are covalently linked to one another either directly or through a short linking chain.

10. A dual synthetic peptide according to claim 9, in which two different sequences of the peptides Ia to Va are linked covalently.

11. A peptide polymer according to claim 1, containing a plurality of identical sequences selected from the sequences I to V in claim 3.

12. A pharmaceutical composition for the treatment of systemic lupus erythematosus comprising an effective amount of a synthetic peptide or peptide polymer according to any one of claims 1 to 11, and a pharmaceutically acceptable carrier.

13. A pharmaceutical composition for the treatment of systemic lupus erythematosus comprising an effective amount of a mixture of at least two different peptides in accordance with any one of the claims 3 to 10.

14. A method for the treatment of systemic lupus erythematosus comprising administering to a systemic lupus erythematosus patient an effective amount of a peptide or peptide polymer according to any one of claims 1 to 11.

15. A method of selecting peptides capable of inhibiting the proliferative response of T lymphocytes from a SLE patient, comprising:

(i) synthesizing a peptide of at least 12 and at most 30 amino acid residues, having a sequence based on the CDR region of the heavy or light chain of a pathogenic anti-DNA monoclonal antibody that induces a SLE-like disease in mice, or an analog thereof;

(ii) testing said peptide or analog for its ability to inhibit the proliferative response of T cells from a SLE patient, or a T cell line or clone which is specific to the 16/6 Id anti-DNA monoclonal antibody to which the T cells are specific; and

(iii) selecting and producing said peptide only if it is capable of inhibiting said proliferative response.